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CLASSIFICATION OF AIR FORCE JOBS INTO APTITUDE CLUSTERS

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Each military service groups its entry-level jobs into clusters based on similarity of aptitude requirements. The configuration of these systems differs by service. The Air Force has four job clusters, labeled Mechanical-M, Administrative-A, General-G, and Electronics-E, which have been used in only slightly modified form since the early 1950s. The purpose of this report is to describe results from an application of a new procedure for homogeneous clustering of regression equations in an Air Force Armed Services Vocational Aptitude Battery (ASVAB) validity study involving 155,000 recruits in 211 technical training programs. Empirical clusters are derived and explained in terms of specialty composition and aptitude profiles. Other potential applications of the procedure are briefly discussed.

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SUMMARY

Each military service groups its entry-level jobs into clusters based on similarity of aptitude requirements. The configuration of these clustering systems differs by service and ranges in number from four in the Air Force to 11 in the Navy. Some of the systems have been in existence for some time despite changes in selection tests and job content. The Air Force has used essentially the same four composite groupings (Mechanical-M, Administrative-A, General-G, and Electronics-E) since the early 1950s. The purpose of this report is to apply a new procedure for homogeneous clustering of entry-level jobs, based on similarity of prediction equations, to a recent set of Air Force entrant data. Specific interest was directed at whether or not the four-group M, A, G, and E solution would emerge from the empirical relationships.

Individual training records were assembled for all persons entering Air Force technical training who took the Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, and 10. Subtest scores in standard score form were recorded, together with final school grade. After editing for missing data, there were 154,000 cases, representing each of 211 technical training programs. Regression equations were obtained within each program using the 10 ASVAB subtests as predictors and final school grades as criteria. The individual equations were then hierarchically clustered based on similarity of the regression weights. Once the terminal clusters had been formed, composite regression equations were obtained to examine the profiles of abilities required within each cluster. Baseline equations were also obtained for comparative purposes within each of the four existing M, A, G, and E job clusters.

Results focused on discussion of the last six stages of the hierarchical solution. Four of the six groups were approximately equivalent to the current M, A, G, and E clusters in terms of both job content and profiles of regression weights. The fifth and sixth groups identified were notable in a number of respects. The fifth group was composed of a mixed set of specialties with one characteristic in common; namely, performance in training was not well predicted by any of the ASVAB subtests. Regression weights were uniformly low for all subtests in this equation. Further inspection of this group revealed schools of three basic types: (a) those with little or no cognitive demands, (b) those with significant cognitive demands presumably outside the scope of the present ASVAB, and (c) advanced training schools. The latter two types were seen to offer the most fertile ground for expanding the coverage of the current battery or for developing special purpose selection instruments. The final (sixth) group was noteworthy in that it contained relatively few specialties--primarily those in the areas of tactical and strategic aircraft maintenance. Based on the salient weights for the subtests, these specialties appeared to require ability across the whole spectrum of the battery. Success in training was essentially a joint function of the technical subtests normally associated with these occupations (i.e., Auto and Shop Information, Mechanical Comprehension) and the more academically oriented subtests such as Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension. This was interpreted to be evidence of an emerging requirement for "generalists" who demonstrate a relatively broad range of talents across the whole domain of abilities as measured in the ASVAB. Implications for changes in the classification structure, test content, and composite configurations are discussed.

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PREFACE

The Air Force Human Resources Laboratory is tasked by Air Force Regulation 35-8, Air Force Military Personnel Testing System, with conducting research and development in support of the Armed Services Vocational Aptitude Battery (ASVAB). The current effort was accomplished under Project 7719, Force Acquisition and Management System, Task 771918, Personnel Qualifications Tests, and Work Unit 77191846, Development and Validation of Enlisted Selection Methodologies.

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CLASSIFICATION OF AIR FORCE JOBS INTO APTITUDE CLUSTERS

I. INTRODUCTION

The four Air Force selection composites--Mechanical (M), Administrative (A), General (G), and Electronics (E)--have been in use in one form or another since the mid-1950s (Weeks, Mullins, & Vitola, 1975). Each refers to a particular Armed Services Vocational Aptitude Battery (ASVAB) subtest configuration for use in selecting and classifying recruits into one of four job clusters also categorized into M, A, G, and E groups. The evolution of the system as it presently exists was guided by a mix of expert judgment and analysis of empirical relationships between the subtests and performance in Air Force training. It represents an attempt to group similar career fields based on their aptitude requirements such that a minimal amount of information is lost in the classification process. The four-group solution was a compromise between having only one broadly defined general ability composite applicable to all career fields and having a separate composite for each career field. The former was thought to be too inaccurate for differentiating among the wide diversity of occupations, each with its own unique requirements; and the latter was too cumbersome for operational purposes.

Since the mid-1950s, there have been several changes in both the composition of the tests and Air Force career fields. In 1973, the Air Force selection test in use since 1950 was replaced by the ASVAB, a joint-service test. Several content areas were dropped--most notably, Pattern Comprehension and Hidden Figures; several were added; and others were changed in character. There have also been changes in Air Force specialties (AFSs) as the content of Air Force jobs changed subtly, and in some cases dramatically, over the past 20 years Training programs underwent corresponding changes as they were updated to reflect current procedures and innovations in technology. Some AFSs were deleted, some were added, and some changed in ways that were not as noticeable. In the intervening years, there have also been advances in analytic capabilities which allow for more sophisticated techniques for job clustering. Given these circumstances, it seemed appropriate to revisit the composites to see how well they reflect today's personnel and training environment. The purpose of this document is to report on a homogeneous clustering of technical school prediction equations, with a view toward comparing a recent empirical solution to the traditional MAGE composite structure. In the process of conducting these analyses, it was expected that some implications could also be drawn about an enduring theoretical controversy over the relative importance of a single generalized measure of cognitive ability ("g" factor) versus the use of multiple ability measures in personnel selection. This issue has been raised anew by recent findings which suggest that (a) job requirements can be characterized mainly in terms of overall demand for cognitive ability (Hunter, 1980; Hunter, 1986; Jensen, 1986; Schmidt, Hunter, and Pearlman, 1981; Thorndike, 1985) and (b) this factor is so dominant that unique patterns of specific abilities play a relatively minor role in determining a person's occupational success. If true, then multiple aptitude batteries and multiple composites would seem to have little utility in the context of personnel selection decisions.

II. METHOD

Predictor Variables

Individual records were assembled for all persons who had been administered ASVAB Forms 8, 9, and 10 and who had completed an Air Force technical training program. Scores for the ASVAB subtests, as shown in Table 1, were recorded in both raw score and standard score form (Ree, Mathews, Mullins, & Massey, 1982). Standard scores range from 20 to 80 and have an overall mean of 50 and a standard deviation of 10 in the 1980 standardization group. After removal of records without a numeric final school grade, there were 154,844 cases in the sample. Descriptive data for the sample are shown in Table 2.

Table 1. ASVAB Forms 8, 9, and 10 Subtests and Composites

Subtest	Testing time (minutes)	Number of items	Type
General Science (GS)	11	25	Power
Arithmetic Reasoning (AR)	36	30	Power
Word Knowledge (WK)	11	35	Power
Paragraph Comprehension(PC)	13	15	Power
Numerical Operations(NO)	3	50	Speed
Coding Speed (CS)	7	84	Speed
Auto and Shop Information (AS)	11	25	Power
Mathematics Knowledge (MK)	24	25	Power
Mechanical Comprehension (MC)	19	25	Power
Electronics Information (EI)	9	20	Power

Composite	Subtest composition
Mechanical (MECH)	MC + GS + 2AS
Administrative (ADMIN)	NO + CS + (WK + PC)
General (GEN)	(WK + PC) + AR
Electronics (ELECT)	AR + MK + EI + GS

Table 2. Sample Score Ranges, Means, and Standard Deviations

Subtest	Range Min	Range Max	Mean	SD
General Science	22	68	54.10	7.26
Arithmetic Reasoning	29	66	54.71	6.88
Word Knowledge	22	61	52.50	5.81
Paragraph Comprehension	20	61	52.63	5.68
Numerical Operations	20	61	52.49	6.67
Coding Speed	22	71	51.53	7.25
Auto and Shop Information	26	69	55.98	8.15
Mathematics Knowledge	30	67	52.76	7.74
Mechanical Comprehension	25	70	55.05	7.85
Electronics Information	25	69	54.50	7.60

Note. N = 154,844.

Performance Criteria/Specialties

Success in technical school was measured by the final school grade recorded at the end of training. These values are expressed as percentages, usually between 60 and 100. Overall, there were 211 different technical schools represented. Each had more than 100 attendees; some had considerably more. Attendance ranged from 100 to 15,584. The average course size was 734 people.

Analyses

For records within each of the 211 schools, regression analyses were performed with final school grade as the criterion and the ASVAB subtests as predictors. In the analysis, all of the predictors were permitted to draw a least squares regression weight as appropriate in the solution (exhaust option).

A modified hierarchical grouping (HIER-GRP) analysis was performed on the resulting equations (Ward, Treat, & Albert, 1985). In this procedure, predicted scores were generated for all recruits in the sample across all courses by applying the course-specific regression weights to each recruit's ASVAB subtest score. Technical school equations were then grouped on the basis of similarity of their predicted score vectors, beginning with 211 separate equations and ending with a single consolidated equation.

A traditional four-group MAGE solution was also derived for comparative purposes. For these analyses, specialties as described in AFR 39-1 were grouped into one of the M, A, G, or E areas according to the designated selector aptitude index (AI). Specialties with multiple AIs listed (e.g., M or E) were included in both clusters. This operation resulted in four (minimally overlapping) sets of specialties from which subtest equations were derived. The resulting equations were then compared with those obtained in the empirical solution to determine similarities and differences in subtest weighting patterns.

III. RESULTS

The grouping diagram shown in Figure 1 depicts the last six stages of the modified hierarchical clustering. Inspection of the group composition (also shown in Appendix A) indicated that Clusters A, B, and C corresponded approximately to the traditionally defined Administrative, General, and Electronics groups respectively. Of the total of 25 specialties in Cluster A, 48% had an Administrative requirement in AFR 39-1. Principal Administrative specialties contained in the cluster included Personnel Specialist and Financial Management Specialist (see Table 3). In Cluster B, there were 30 specialties, of which 70% had a General requirement. This cluster contained Security Specialist, Medical Services Specialist, and Command and Control Specialist. Cluster C contained 83 specialties, of which 70% were listed as having an Electronics requirement. Included in this cluster were Ground Radio Communications Specialist, Avionics Instrument Systems Specialist, and Airborne Early Warning Radar Specialist. Cluster D, which contained 30 specialties, was difficult to characterize on the basis of the jobs included. There was good reason for this as will be noted later. Cluster E was a mix of mechanical maintenance and craftsman jobs. Of the 37 specialties included, 81% had a Mechanical requirement. Jet Engine Mechanic, General Purpose Vehicle Mechanic and Construction Equipment Operator were included in this cluster. Cluster F was the smallest in terms of the number of specialties included (6), although a relative large number of people were assigned to the specialties. These were almost exclusively AFSs associated with Tactical and Strategic Aircraft Engine Maintenance.

Table 4 shows the regression weights corresponding to each of the groups. The weights indicate which of the ASVAB subtests contribute to the prediction of training success within each of the clusters. There were distinct patterns observed, some of which did not correspond to the present composites. The equation for Cluster A included relatively large weights for the AR, WK, PC, CS, and MK subtests while the equation for Cluster B included GS but not CS. The main distinguishing features of this equation were the higher weights on GS and WK relative to the Cluster A equation. The salient weights in the Cluster C equation were AR, PC, MK, and EI. The equation for Cluster D was notable in that none of the subtests had a consequential weight, indicating that these career fields were not well predicted by subtests in the current ASVAB. This is why Cluster D was difficult to characterize earlier on the basis of specialty content. The equation for Cluster E was distinguished by large weights on AR, AS, MK, and EI. Finally, Cluster F appeared to draw salient weights on all subtests except NO and CS.

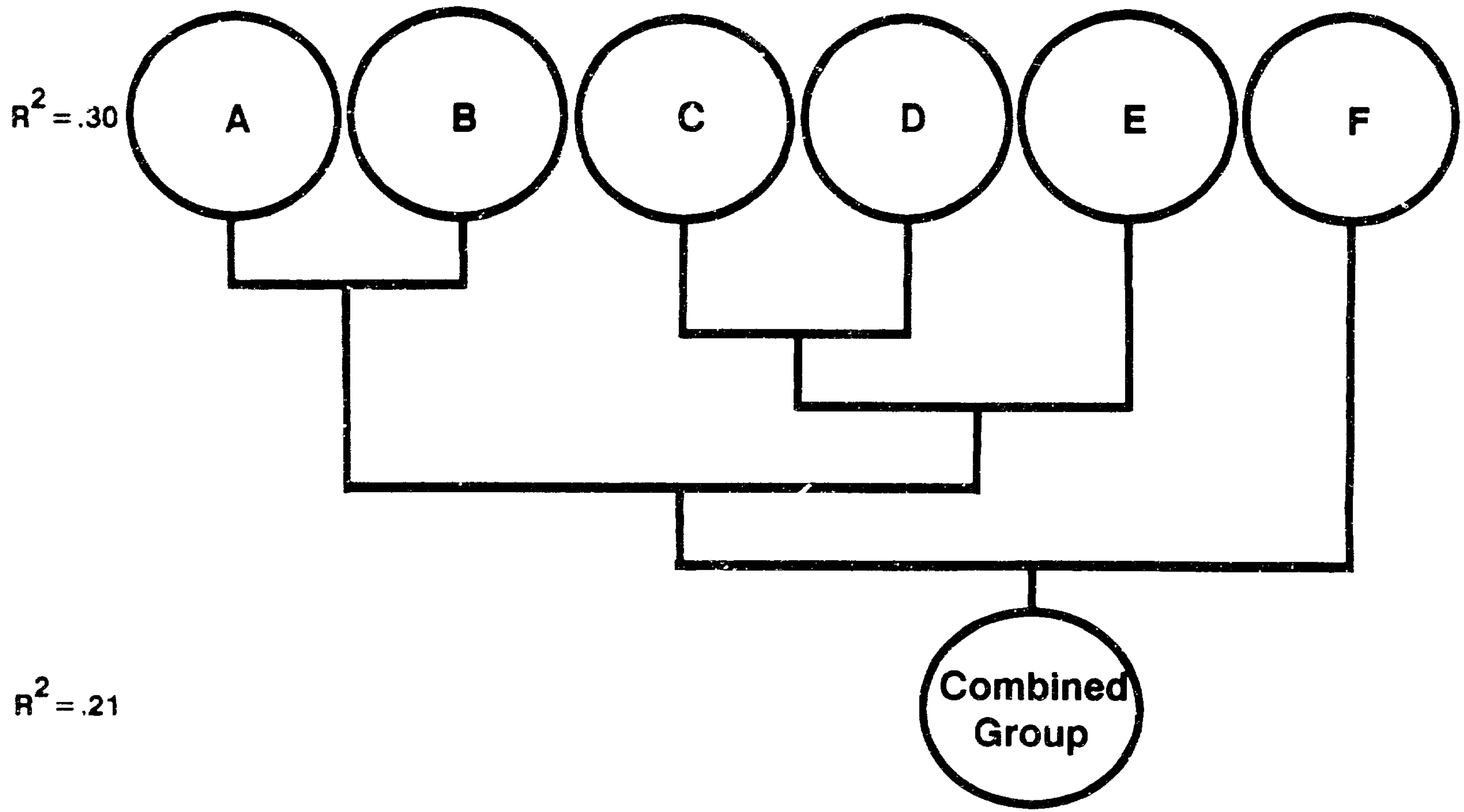

Figure 1. **Hierarchical Grouping Diagram.**

Table 3. **Six-Cluster Specialty Composition**

Cluster	N	No of AFSs	Description	Representative specialties
A	25,357	25	Predominately Administrative	Personnel Specialist; Personnel Affairs Specialist; Financial Management Specialist; Civil Engineering Resources Management Specialist; Inventory Management Specialist; Freight Traffic Specialist.
B	41,070	30	Predominately General	Security Specialist; Medical Services Specialist; Medical Lab Specialist; Intelligence Specialist; Command and Control Specialist; Nuclear Weapons Specialist; Plumbing Specialist.
C	38,509	83	Predominately Electronics	Ground Radio Communications Specialist; Electronic Computer and Switching System Specialist; Avionics Instrument Systems Specialist; Avionic Communications System Specialist; Airborne Early Warning Radar Specialist.
D	11,552	30	Mixed	Cryptologic Linguist Specialist; Precision Measuring Equipment Laboratory Technician; Fabrication and Parachute Specialist; Fire Protection Specialist; Fuel Specialist; Chapel Management Specialist; Education and Training Manager.
E	26,906	37	Predominately Mechanical	Aircraft Environmental Systems Mechanic; Jet Engine Mechanic; Aircraft Pneudraulic Systems Mechanic; Aircraft Armament Systems Specialist; General Purpose Vehicle Mechanic; Construction Equipment Operator.
F	11,450	6	Tactical/Strategic Aircraft Maintenance	Helicopter Mechanic; Tactical Aircraft Maintenance Specialist; Strategic Aircraft Maintenance Specialist; Metal Fabricating Specialist.

Note. Table excerpted from Appendix A.

Table 4. **Raw-Score Regression Weights for Six Clusters**

Cluster	GS	AR	WK	PC	NO	CS	AS	MK	MC	EI
A	05	13	15	12	01	09	04	19	-03	01
B	14	16	24	15	01	07	04	12	-01	03
C	06	11	04	08	02	05	05	19	04	08
D	04	07	02	04	04	00	07	05	06	-01
E	05	11	01	06	00	04	13	12	07	08
F	13	11	14	11	03	04	26	13	08	12
ALL CLUSTERS COMBINED	07	12	12	10	02	07	07	16	01	06

Note. Decimals omitted.
Weights $\geq$ .08 are circled.

MAGE Solutions

Table 5 shows the regression weights derived from the current MAGE job clusters. Similarities can be noted between these equations and those presented in Table 4. To make comparisons easier, bar charts were constructed (Figure 2) to show the subtest weights side by side. The equation for Cluster A aligns fairly closely with the Administration equation; Cluster B, with the General equation; and Cluster C, with the Electronics equation--although this similarity is less than the previous two. Finally, the Cluster E equation bears moderate resemblance to the Mechanical equation. Clusters D and F have no analogous equations in the present composite structure.

Table 5. **Raw-Score Regression Weights for Current MAGE Groups**

Group	GS	AR	WK	PC	NO	CS	AS	MK	MC	EI
MECH	07	13	08	08	02	04	10	13	05	09
ADMIN	05	14	12	11	03	06	06	17	02	00
GEN	09	17	20	14	01	07	06	14	01	03
ELECT	05	09	02	04	01	04	08	15	07	08

Note. Decimals omitted.
Weights $\geq$ .08 are circled.

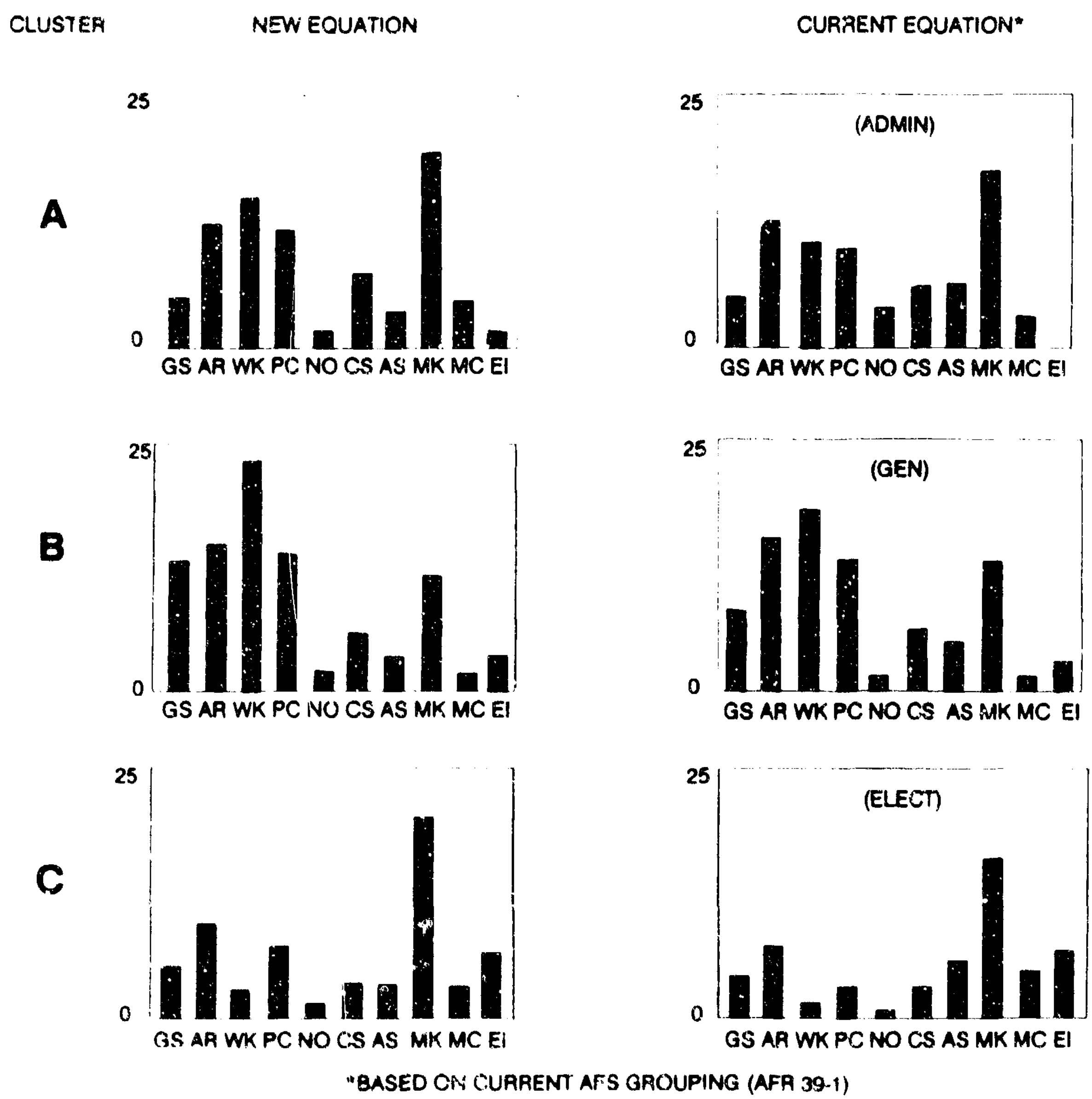

Figure 2. Cluster Weights Versus Current MAGE Weights.

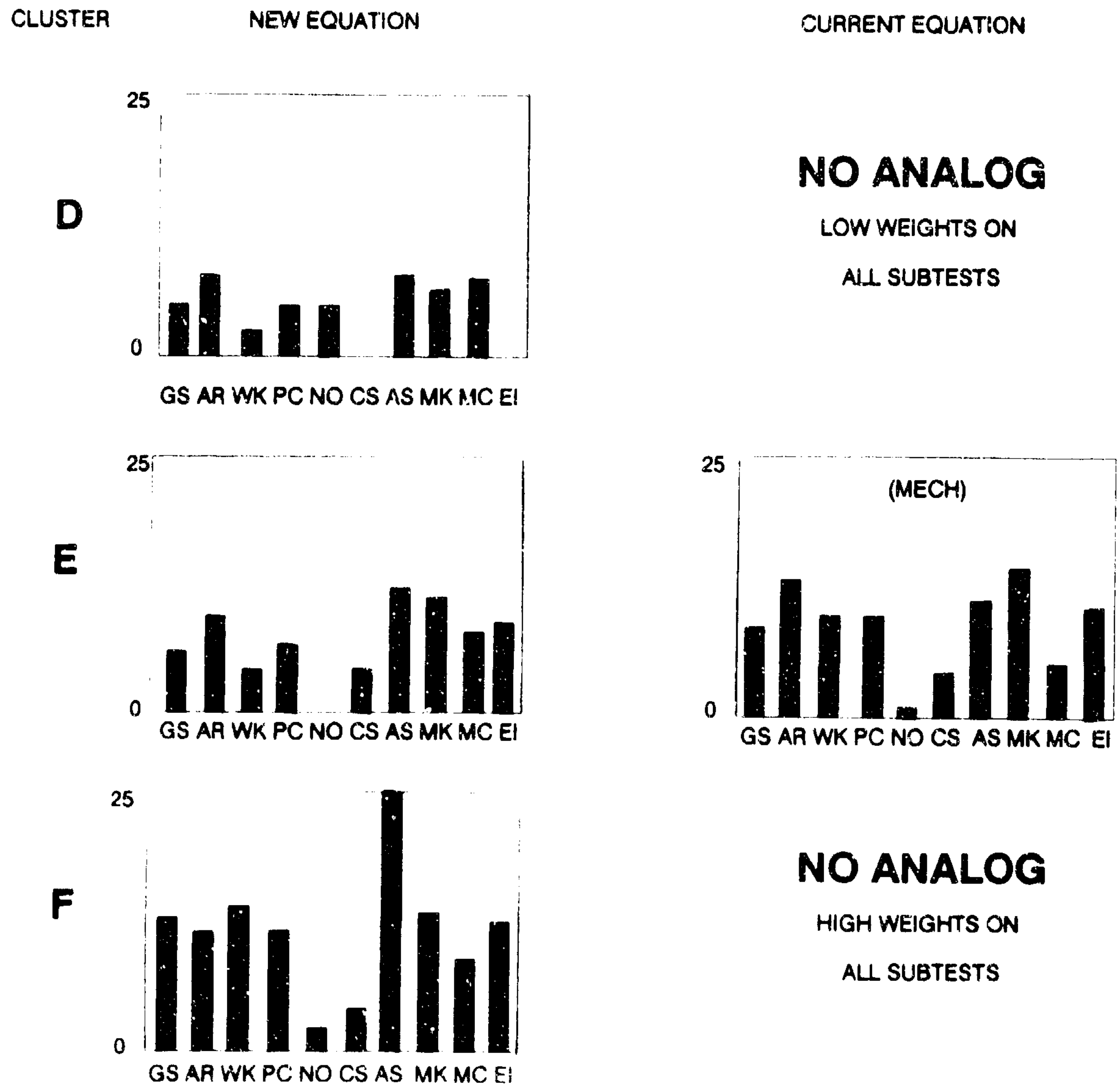

Figure 2. (Continued).

IV. DISCUSSION

The homogeneous clustering of technical school regression equations revealed a pattern of job clusters and corresponding composites that, at the six-stage solution, yielded four groups/composites that closely resembled the current MAGE system. This finding was rather remarkable considering the extent of changes that have presumably taken place over the past 35 years in both test content and the composition of the specialty training programs.

The enduring nature of the MAGE distinctions, however, should not obscure the fact that individual specialties may indeed have changed sufficiently to warrant dissolution or perhaps reclassification from one to another of the MAGE categories. In fact, there is strong likelihood that some of the categories have grown or diminished in absolute size over time. One could speculate that the absolute size of the Electronics cluster--which would have been rather small initially--now represents the second largest group in terms of numbers of people and is by far the largest group in terms of number of specialties.

Two additional groups/composites (Clusters D and F) were newly defined in this analysis. The first group was characterized by low weights across all the ASVAB subtests. Career fields included represent those for which the present subtests have little predictive power and would thus be fertile ground for additional research. Examples of at least three types were apparent. Some career fields seemed to have few cognitive demands. Success in training was principally a function of factors other than ability as defined in the ASVAB. For these kinds of assignments, there are likely no new cognitive tests that would assist in discriminating between those who will or will not succeed. This does not rule out the potential value of some non-cognitive assessment. Other career fields included in this group are of a quite different character. They require abilities that appear to be outside the domain of the ASVAB but which potentially are measurable with new advances in cognitive assessment. It has long been known, for example, that spatial factors are not well represented in ASVAB nor are psychomotor abilities. The third class of the technical schools which were not well predicted fell into the category of "Advanced" courses given at the 5- and 7-skill levels. Here, the effects of prior experience begin to attenuate the relationship between entry level aptitudes and success in training.

The other newly defined group (Cluster F) seems to represent jobs which are very complex and highly demanding with respect to the ASVAB subtests. They require abilities across the whole spectrum of presently available measures. The prevailing ASVAB requirements of this group suggest a need for "generalists" as opposed to "specialists" for entry into these specialties; i.e., persons who demonstrate proficiencies in academic as well as technical domains. It is not clear whether this group existed in earlier analyses or whether it represents an emerging requirement. In any case, it is sizable and if it increases over time, may put additional pressures on recruiting resources to obtain people with this ability pattern. Some consideration may also have to be given to forming a new composite for these specialties--one that draws from all subtest areas.

The different patterns of ability detected for the six empirical groups also suggests something about the ASVAB and its ability to distinguish among specialties (i.e., its differential prediction capabilities). There has been a vast amount of speculation about whether a single composite would work about as well as separate composites (Hunter, 1980; Hunter, 1986; Jensen, 1986; Schmidt et al., 1981; Thorndike, 1985). The evidence found here suggests that there are different equations underlying success in these specialty clusters. The amount of difference depends on how the common versus unique contributions are measured. It seems clear though that the battery has differential prediction value and that its potential may not be fully capitalized upon at present. As a rough approximation, the predictive accuracy associated with six equations ($R^2 = .30$) was compared with that associated with a single common equation ($R^2 = .21$). The difference was statistically significant ($p < .001$), with the multiple equations representing a 42% increase in predictive accuracy as measured by R^2 change over use of a single equation. The magnitude of these differences might be mitigated somewhat by overfitting; but with the sample sizes involved, this effect was likely to be minimal. Overall, the results are not consistent with the position that a single composite (presumably measuring "g") suffices to predict achievement across occupationally diverse training areas.

They are consistent with the view that tasks in different training areas can and do reflect unique requirements that can be assessed only with a multiple test battery using separate prediction composites.

From a test perspective, not all the subtests seemed to perform as well as might be expected. NO, CS, and, to a certain extent, MC made weaker contributions than did the other subtests. Both NO and CS are "speeded tests," whereas MC is a power test. NO had little to contribute to any of the specialty groups. CS made modest contributions to the Administrative and General clusters whereas MC affected primarily the General group--but to a lesser extent than the other subtests. These results could mean that speeded requirements are slight in these clusters or that the NO subtest is not as well suited to measuring "speeded" abilities as it could be. Further research on these issues seems warranted.

The modified hierarchical grouping procedure used in the analysis represents a significant step forward in comparison to procedures traditionally used for these purposes. It yielded results that were easily obtained and readily interpretable, and that could have direct implications for making the job clusters more homogeneous with respect to aptitude requirements. On the testing side, the procedure could also be useful in generating composites that are optimally formed to measure the relevant aptitude dimensions. A unique feature of this analysis technique allows for grouping based only on the coefficients associated with the test variables--and ignoring the coefficients on the unit vectors (course constants). This means that the clustering is not driven by overall differences in the level of grades assigned within each of the courses. Although these may not differ by much in the present context, this source of equation heterogeneity could be much more influential with other types of dependent measures (e.g., job tenure, supervisory ratings).

There are several research contexts in which the modified procedure could be applied: (a) development of test composites and job assignment clusters for classification of officers/aircrew; (b) clustering equations that predict personnel tenure; (c) various policy modeling and policy capturing exercises that support the Weighted Airman Promotion System (WAPS); and (d) training R&D settings where one might want to distinguish aptitude by treatment combinations that maximize overall training achievement.

V. CONCLUSIONS

1. The present system of grouping technical schools and forming composites into four sets (MAG&E) was found to be remarkably robust considering the myriad of changes that have taken place since the system was first established. Four of the six groups defined by an empirical clustering of subtest regression equations strongly resembled the currently defined MAGE subgroups.

2. Evidence was found that the ASVAB subtests could differentiate among Air Force enlisted job clusters. To be sure, the clusters share much in common; however, the equations seem to have different characteristics which were in line with expectations about what ought to be required in the broadly defined training programs. This would seem to argue for a continued reliance on multiple composites rather than reverting to a single generalized measure of cognitive ability.

3. As opportunities arise, modifications should be made to both the career field clusters and the prediction composites defined in AFR 39-1, to improve the alignment between composites and specialty groups.

4. A number of specialties are not well predicted (Cluster D)--some because they have few cognitive demands and some because the demands they make are not sufficiently represented in the current ASVAB. Each type should be studied further--especially those career fields that require test measures beyond those currently found in the ASVAB.

5. Consideration should be given to forming a new cluster/composite based on the sixth group identified in this study (Cluster F). The tactical/strategic aircraft maintenance specialties included in the group seemed to reflect a "generalist" requirement--one that required abilities across the full domain of subtest measures.

6. Some consideration should be given to replacing or upgrading some of the present ASVAB subtests--particularly NO, CS, and MC, since they had salient weights on few, if any, of the job clusters.

7 From a methodological standpoint, the modified HIER-GRP procedure provides a meaningful analysis technique that would also be useful in other contexts (officer selection and classification, forming composites based on other criteria, etc.).

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APPENDIX A: AIR FORCE TECHNICAL SCHOOLS

No.	Aptitude area	AFS	N	Cluster	Title
1	MECH	11430	231	A	AIRCRAFT LOADMASTER
2	GEN	12230	900	B	AIRCREW LIFE SUPPORT SPECIALIST
3	GEN	20130	153	A	INTELLIGENCE OPERATIONS SPECIALIST
4	GEN	20131	241	B	TARGET INTELLIGENCE SPECIALIST
5	GEN	20230	221	B	RADIO COMMUNICATIONS ANALYSIS SPECIALIST
6	GEN	20230A	136	A	RADIO COMMUNICATIONS ANALYSIS/SECURITY SPECIALIST, RADIO
7	GEN	20530	163	B	ELECTRONIC INTELLIGENCE OPERATIONS SPECIALIST
8	GEN	20630	251	C	IMAGERY INTERPRETER SPECIALIST
9	ADMIN	20731	860	A	MORSE SYSTEMS OPERATOR
10	GEN	20831A	128	D	GERMANIC CRYPTOLOGIC LINGUIST SPECIALIST, GERMAN
11	GEN	20832A	135	D	ROMANCE CRYPTOLOGIC LINGUIST SPECIALIST, SPANISH (LATIN AMER)
12	GEN	20833A	362	D	SLAVIC CRYPTOLOGIC LINGUIST SPECIALIST, RUSSIAN
13	GEN	20833C	104	D	SLAVIC CRYPTOLOGIC LINGUIST SPECIALIST, CZECH
14	GEN	20834A	183	A	FAR EAST CRYPTOLOGIC LINGUIST SPECIALIST, CHINESE (MANDARIN)
15	GEN	20834G	219	D	FAR EAST CRYPTOLOGIC LINGUIST SPECIALIST, KOREAN
16	GEN	20835A	152	D	MID EAST CRYPTOLOGIC LINGUIST SPECIALIST, ARABIC
17	GEN	20850	374	D	VOICE PROCESSING SPECIALIST
18	GEN	20853A	205	D	SLAVIC CRYPTOLOGIC LINGUIST SPECIALIST, RUSSIAN
19	GEN	23131	163	B	GRAPHICS SPECIALIST
20	GEN	23132	146	B	STILL PHOTOGRAPHIC SPECIALIST
21	GEN	23330	325	C	IMAGERY PRODUCTION SPECIALIST
22	GEN	25130	729	A	WEATHER SPECIALIST
23	GEN	27230	1680	C	AIR TRAFFIC CONTROL OPERATOR
24	GEN	27330	113	C	COMBAT CONTROL OPERATOR
25	GEN	27430	215	B	COMMAND AND CONTROL SPECIALIST
26	GEN	27530	308	E	TACTICAL AIR COMMAND AND CONTROL SPECIALIST
27	GEN	27630B	455	C	AEROSPACE CONTROL AND WARNING SYSTEMS OPERATOR - 416L SEMIAUTOMATIC GROUND ENVIRONMENT (SAGE)
28	GEN	27630C	363	C	AEROSPACE CONTROL AND WARNING SYSTEMS OPERATOR - 407L TACTICAL AIR CONTROL SYSTEMS (TACS)
29	GEN	29130	1806	C	TELECOMMUNICATIONS OPERATIONS SPECIALIST
30	GEN	29150	120	C	TELECOMMUNICATIONS OPERATIONS SPECIALIST
31	ADMIN	29333	608	C	GROUND RADIO OPERATOR
32	ELECT	30230	281	C	WEATHER EQUIPMENT SPECIALIST
33	ELECT	30331	265	C	AIR TRAFFIC CONTROL RADAR SPECIALIST
34	ELECT	30332	517	C	AIRCRAFT CONTROL AND WARNING RADAR SPECIALIST
35	ELECT	30333	472	C	AUTOMATIC TRACKING RADAR SPECIALIST
36	ELECT	30430	908	C	WIDEBAND COMMUNICATIONS EQUIPMENT SPECIALIST
37	ELECT	30431	306	C	NAVIGATIONAL AIDS EQUIPMENT SPECIALIST
38	ELECT	30434	1631	C	GROUND RADIO COMMUNICATIONS SPECIALIST
39	ELECT	30435	153	C	TELEVISION EQUIPMENT SPECIALIST
40	ELECT	30436	113	C	SPACE COMMUNICATIONS SYSTEMS EQUIPMENT OPERATOR/SPECIALIST
41	ELECT	30436A	136	C	SPACE COMMUNICATIONS SYSTEMS EQUIPMENT OPERATOR/SPECIALIST, DEFENSE SATELLITE

APPENDIX A: (Continued)

No.	Aptitude area	AFS	N	Cluster	Title
42	ELECT	30450	306	C	WIDEBAND COMMUNICATIONS EQUIPMENT SPECIALIST
43	ELECT	30454	414	D	GROUND RADIO COMMUNICATIONS SPECIALIST
44	ELECT	30534	462	C	ELECTRONIC COMPUTER AND SWITCHING SYSTEMS SPECIALIST
45	ELECT	30534E	499	C	ELECTRONIC COMPUTER AND SWITCHING SYSTEMS SPECIALIST GENERAL COMPUTER SYSTEMS
46	ELECT	30534G	274	C	ELECTRONIC COMPUTER AND SWITCHING SYSTEMS SPECIALIST, 465L, RCC-EDLCC/SACCS
47	ELECT	30534P	124	C	ELECTRONIC COMPUTER AND SWITCHING SYSTEMS SPECIALIST, 490L O/S AUTOVON
48	ELECT	30630	666	C	ELECTRONIC COMMUNICATIONS AND CRYPTOGRAPHIC EQUIPMENT SYSTEMS REPAIRMAN
49	ELECT	30631	226	C	ELECTRONIC-MECHANICAL COMMUNICATIONS AND CRYPTOGRAPHIC EQUIPMENT
50	ELECT	30632	482	C	TELECOMMUNICATIONS SYSTEMS/ EQUIPMENT MAINTENANCE SPECIALIST
51	ELECT	30650	810	E	ELECTRONIC COMMUNICATIONS AND CRYPTOGRAPHIC EQUIPMENT SYSTEMS REPAIRMAN
52	ELECT	30652	322	C	TELECOMMUNICATIONS SYSTEMS/EQUIPMENT MAINTENANCE SPECIALIST
53	ELECT	30730	625	C	TELECOMMUNICATIONS SYSTEMS CONTROL SPECIALIST
54	ELECT	31630F	170	C	MISSILE SYSTEMS ANALYST SPECIALST, LGM-25
55	ELECT	31630G	361	C	MISSILE SYSTEMS ANALYST SPECIALIST, WS-133AM, WS-133AM/CDB
56	ELECT	31630T	264	C	MISSILE SYSTEMS ANALYST SPECIALIST, AGM-69A
57	ELECT	31633	190	C	INSTRUMENTATION MECHANIC
58	ELECT	32130K	310	C	BOMB-NAVIGATION SYSTEM MECHANIC, B-52G/H (ASQ-38,ASQ-151)
59	ELECT	32132	102	C	WEAPON CONTROL SPECIALIST
60	ELECT	32132A	105	C	WEAPON CONTROL SYSTEMS SPECIALIST, F-106A/B: (MA-1, ASQ-25 SYSTEMS)
61	ELECT	32132P	134	E	WEAPON CONTROL SYSTEMS SPECIALIST, F-4C/D: (APQ-109/ APA-165)
62	ELECT	32132Q	357	E	WEAPON CONTROL SYSTEMS SPECIALIST, F-4E/G: (APQ-120)
63	ELECT	32232A	105	C	AVIONIC SENSOR SYSTEMS SPECIALIST, RECONNAISSANCE ELECTRONIC
64	ELECT	32232B	257	C	AVIONIC SENSOR SYSTEMS SPECIALIST, TACTICAL/REAL TIME DISPLAY
65	ELECT	32430	1023	C	PRECISION MEASURING EQUIPMENT LABORATORY SPECIALIST
66	ELECT	32470	198	D	PRECISION MEASURING EQUIPMENT LABORATORY TECHNICIAN
67	ELECT	32530	607	C	AUTOMATIC FLIGHT CONTROL SYSTEMS SPECIALIST
68	ELECT	32531	856	C	AVIONICS INSTRUMENT SYSTEMS SPECIALIST
69	ELECT	32633A	127	C	INTEGRATED AVIONICS ELECTRONIC WARFARE EQUIPMENT AND COMPONENT
70	ELECT	32634A	247	A	INTEGRATED AVIONICS COMPUTERIZED TEST STATION AND COMPONENT
71	ELECT	32634B	114	A	INTEGRATED AVIONICS COMPUTERIZED TEST STATION AND COMPONENT
72	ELECT	32635B	139	C	INTEGRATED AVIONICS MANUAL TEST STATION AND COMPONENT
73	ELECT	32636	436	C	INTEGRATED AVIONICS ATTACK CONTROL SYSTEMS SPECIALIST
74	ELECT	32637	368	C	INTEGRATED AVIONICS INSTRUMENT AND FLIGHT CONTROL SYSTEMS
75	ELECT	32638	492	C	INTEGRATED AVIONICS COMMUNICATIONS, NAVIGATION, AND PENETRATION

APPENDIX A: (Continued)

No.	Aptitude area	AFS	N	Cluster	Title
76	ELECT	32830	912	C	AVIONIC COMMUNICATIONS SPECIALIST
77	ELECT	32831	1002	C	AVIONIC NAVIGATION SYSTEMS SPECIALIST
78	ELECT	32832	111	C	AIRBORNE EARLY WARNING RADAR SPECIALIST
79	ELECT	32833	1688	C	ELECTRONIC WARFARE SYSTEMS SPECIALIST
80	ELECT	32834	885	C	AVIONIC INERTIAL AND RADAR NAVIGATION SYSTEMS SPECIALIST
81	ELECT	32835	107	C	AIRBORNE COMMAND POST COMMUNICATIONS EQUIPMENT SPECIALIST
82	ELECT	32850	178	D	AVIONIC COMMUNICATIONS SPECIALIST
83	ELECT	32853	216	B	ELECTRONIC WARFARE SYSTEMS SPECIALIST
84	ELECT	32873	209	D	ELECTRONIC WARFARE SYSTEMS TECHNICIAN
85	ELECT	34134	403	C	FLIGHT SIMULATOR SPECIALIST
86	ELECT	34136	376	C	NAVIGATION/TACTICS TRAINING DEVICES SPECIALIST
87	MECH	36130	346	C	ANTENNA/CABLE SYSTEMS PROJECT/MAINTENANCE ACTION SPECIALIST
88	MECH	36131	279	E	CABLE SPLICING PROJECT/MAINTENANCE ACTION SPECIALIST
89	ELECT	36231	379	C	TELEPHONE SWITCHING SPECIALIST
90	ELECT	36234	382	C	TELEPHONE AND DATA CIRCUITRY EQUIPMENT SPECIALIST
91	GEN	39130	149	C	MAINTENANCE DATA SYSTEMS ANALYSIS SPECIALIST
92	GEN	39130A	139	B	MAINTENANCE ANALYSIS SPECIALIST, AEROSPACE WEAPONS SYSTEM
93	GEN	39230	361	A	MAINTENANCE SCHEDULING SPECIALIST
94	ELECT	40430	145	C	VISUAL INFORMATION EQUIPMENT MAINTENANCE SPECIALIST
95	ELECT	40431	215	C	AEROSPACE PHOTOGRAPHIC SYSTEMS SPECIALIST
96	ELECT	42330	1235	C	AIRCRAFT ELECTRICAL SYSTEMS SPECIALIST
97	MECH	42331	792	E	AIRCRAFT ENVIRONMENTAL SYSTEMS MECHANIC
98	MECH	42332	350	B	AIRCREW EGRESS SYSTEMS MECHANIC
99	MECH	42333	1024	E	AIRCRAFT FUEL SYSTEMS MECHANIC
100	MECH	42334	1487	E	AIRCRAFT PNEUDRAULIC SYSTEMS MECHANIC
101	MECH	42335	2560	E	AEROSPACE GROUND EQUIPMENT MECHANIC
102	MECH	42632	3140	E	JET ENGINE MECHANIC
103	MECH	42633	502	C	TURBOPROP PROPULSION MECHANIC
104	MECH	42634	352	E	F-100 JET ENGINE MECHANIC
105	MECH	42652	538	D	JET ENGINE MECHANIC
106	MECH	42731	596	C	CORROSION CONTROL SPECIALIST
107	GEN	42732	288	C	NONDESTRUCTIVE INSPECTION SPECIALIST
108	MECH	42733	451	D	FABRICATION AND PARACHUTE SPECIALIST
109	MECH	42734	124	E	METALS PROCESSING SPECIALIST
110	MECH	42735	1239	B	AIRFRAME REPAIR SPECIALIST
111	MECH	43130C	290	F	HELICOPTER MECHANIC, (CH/HH-3, CH/HH-53, AND HH/UH-60)
112	MECH	43130D	163	C	HELICOPTER MECHANIC, SEMIRIGID ROTOR (HH-1H AND UH-1F/P/N)
113	MECH	43131	5160	F	TACTICAL AIRCRAFT MAINTENANCE SPECIALIST
114	MECH	43131C	527	C	TACTICAL AIRCRAFT MAINTENANCE SPECIALIST, F/RF4 AIRCRAFT
115	MECH	43131E	374	F	TACTICAL AIRCRAFT MAINTENANCE SPECIALIST, F-15 AIRCRAFT
116	MECH	43132	5198	F	STRATEGIC AIRCRAFT MAINTENANCE SPECIALIST
117	MECH	43230	117	F	JET ENGINE MECHANIC
118	MECH	44330E	111	E	MISSILE MAINTENANCE SPECIALIST, LGM-25
119	MECH	44330G	605	E	MISSILE MAINTENANCE SPECIALIST, (WS-133A/M, WS-133B)
120	ELECT	44530E	160	C	MISSILE FACILITIES SPECIALIST, LGM 25 (OPERATIONS)
121	ELECT	44530F	100	C	MISSILE FACILITIES SPECIALIST, LGM 25 (MAINTENANCE)
122	ELECT	44530G	303	E	MISSILE FACILITIES SPECIALIST, WS-133B, WS-133A/M

APPENDIX A: (Continued)

No.	Aptitude area	AFS	N	Cluster	Title
123	ELECT	46130	2764	E	MUNITIONS SYSTEMS SPECIALIST
124	MECH/ELECT	46230	319	E	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST
125	MECH/ELECT	46230A	122	D	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, B-52D AIRCRAFT
26	MECH/ELECT	46230C	570	E	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, A-10 AIRCRAFT
127	MECH/ELECT	46230D	1021	E	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, F-4 AIRCRAFT
128	MECH/ELECT	46230E	771	D	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, F-15 AIRCRAFT
129	MECH/ELECT	46230F	475	C	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, F-16 AIRCRAFT
130	MECH/ELECT	46230H	434	E	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, F-111 AIRCRAFT
131	MECH/ELECT	46230K	442	E	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, B-52G/H AIRCRAFT
132	MECH/ELECT	46230Z	332	D	AIRCRAFT ARMAMENT SYSTEMS SPECIALIST, ALL OTHER AIRCRAFT
133	MECH	46330	508	B	NUCLEAR WEAPONS SPECIALIST
134	MECH	47230	243	E	SPECIAL PURPOSE VEHICLE AND EQUIPMENT MECHANIC
135	MECH	47231C	191	E	SPECIAL VEHICLE MECHANIC, MATERIALS HANDLING EQUIPMENT
136	MECH	47231D	147	E	SPECIAL VEHICLE MECHANIC, TOWING AND SERVICING VEHICLES
137	MECH	47232	772	E	GENERAL PURPOSE VEHICLE MECHANIC
138	MECH	47252	132	E	GENERAL PURPOSE VEHICLE MECHANIC
139	GEN	51130	1170	C	COMPUTER OPERATOR
140	GEN	51131	251	C	COMPUTER PROGRAMMING SPECIALIST
141	ELECT	54230	434	E	ELECTRICIAN
142	ELECT	54231	275	C	ELECTRIC POWER LINE SPECIALIST
143	ELECT	54232	809	C	ELECTRICAL POWER PRODUCTION SPECIALIST
144	ELECT	54250	137	E	ELECTRICIAN
145	ELECT	54252	153	C	ELECTRICAL POWER PRODUCTION SPECIALIST
146	ELECT	54530	794	E	REFRIGERATION AND AIR CONDITIONING SPECIALIST
147	MECH	54531	141	E	LIQUID FUEL SYSTEMS MAINTENANCE SPECIALIST
148	MECH	54532	398	C	HEATING SYSTEM SPECIALIST
149	MECH	54550	149	E	REFRIGERATION AND AIR CONDITIONING SPECIALIST
150	MECH	55130	694	E	PAVEMENT MAINTENANCE SPECIALIST
151	MECH	55131	724	E	CONSTRUCTION EQUIPMENT OPERATOR
152	MECH	55230	442	E	STRUCTURAL SPECIALIST
153	MECH	55231	108	E	MASONRY SPECIALIST
154	MECH	55232	311	F	METAL FABRICATION SPECIALIST
155	MECH	55235	386	E	PLUMBER
156	MECH	55255	101	B	PLUMBING SPECIALIST
157	GEN	55330	374	C	ENGINEERING ASSISTANT SPECIALIST
158	ADMIN	55430	249	A	CIVIL ENGINEERING RESOURCES MANAGEMENT SPECIALIST
159	GEN	56630	204	C	PEST MANAGEMENT SPECIALIST
160	MECH	56631	595	C	ENVIRONMENTAL SUPPORT SPECIALIST
161	GEN	57130	2950	D	FIRE PROTECTION SPECIALIST
162	GEN	57150	717	D	FIRE PROTECTION SPECIALIST
163	ADMIN	60000	718	D	TRANSPORTATION SUPT
164	ADMIN	60230	448	D	PASSENGER AND HOUSEHOLD GOODS SPECIALIST
165	ADMIN	60231	417	A	FREIGHT AND PACKAGING SPECIALIST
166	ADMIN	60530	651	A	AIR PASSENGER SPECIALIST
167	ADMIN	60531	1641	C	AIR CARGO SPECIALIST
168	GEN	62230	1500	B	FOOD SERVICE SPECIALIST
169	GEN	62231	411	B	DIET THERAPY SPECIALIST
170	GEN	63130	3476	E	FUEL SPECIALIST

APPENDIX A: (Concluded)

No.	Aptitude area	AFS	N	Cluster	Title
171	GEN	63150	228	D	FUEL SPECIALIST
172	GEN	64530	5025	A	INVENTORY MANAGEMENT SPECIALIST
173	GEN	64531	2143	A	MATERIEL STORAGE AND DISTRIBUTION SPECIALIST
174	ADMIN	64532	212	B	SUPPLY SYSTEMS ANALYSIS SPECIALIST
175	ADMIN	65130	300	B	CONTRACTING SPECIALIST
176	ADMIN	65170	120	A	CONTRACTING SUPERVISOR
177	ADMIN	67231	592	A	FINANCIAL MANAGEMENT SPECIALIST
178	ADMIN	67232A	461	B	FINANCIAL SERVICES SPECIALIST MILITARY PAY
179	ADMIN	67232B	303	C	FINANCIAL SERVICES SPECIALIST, TRAVEL PAY
180	ADMIN	70130	210	D	CHAPEL MANAGEMENT SPECIALIST
181	ADMIN	70230	136	B	ADMINISTRATION SPECIALIST
182	ADMIN	70230A	1289	A	ADMINISTRATION SPECIALIST (ADMINISTRATION MANAGEMENT)
183	ADMIN	70230B	5564	A	ADMINISTRATION SPECIALIST (STAFF SUPPORT ADMINISTRATION)
184	ADMIN	70230C	1815	A	ADMINISTRATION SPECIALIST (UNIT/ORDERLY ROOM ADMINISTRATION)
185	ADMIN	73230	2509	A	PERSONNEL SPECIALIST
186	ADMIN	73231	219	A	PERSONAL AFFAIRS SPECIALIST
187	GEN	75100	423	D	EDUCATION AND TRAINING MANAGER
188	GEN	75330	207	C	COMBAT ARMS TRAINING AND MAINTENANCE SPECIALIST
189	GEN	81130	15584	B	SECURITY SPECIALIST
190	GEN	81132	5603	B	LAW ENFORCEMENT SPECIALIST
191	GEN	81132A	938	B	LAW ENFORCEMENT SPECIALIST, MILITARY WORKING DOG QUALIFI
192	GEN	81150	5344	B	SECURITY SPECIALIST
193	GEN	81152A	155	D	LAW ENFORCEMENT SPECIALIST, MILITARY WORKING DOG QUALIFI
194	GEN	81172	109	D	LAW ENFORCEMENT SUPERVISOR
195	GEN	81230	109	B	LAW ENFORCEMENT SPECIALIST
196	GEN	90230	3181	B	MEDICAL SERVICES SPECIALIST
197	GEN	90231	129	D	CARDIOPULMONARY LABORATORY SPECIALIST
198	GEN	90232	441	B	SURGICAL SERVICE SPECIALIST
199	GEN	90330	442	C	RADIOLOGIC SPECIALIST
200	GEN	90430	144	B	CARDIOPULMOMARY LABORATORY SPECIALIST
201	GEN	90530	300	A	PHARMACY SPECIALIST
202	GEN	90630	868	A	MEDICAL ADMINISTRATIVE SPECIALIST
203	GEN	91430	144	D	MENTAL HEALTH UNIT SPECIALIST
204	GEN	91530	412	A	MEDICAL MATERIEL SPECIALIST
205	ELECT	91830	140	C	BIOMEDICAL EQUIPMENT MAINTENANCE SPECIALIST
206	GEN	92230	161	D	AIRCREW LIFE SUPPORT SPECIALIST
207	GEN	92430	811	B	MEDICAL LABORATORY SPECIALIST
208	GEN	92450	268	D	MEDICAL LABORATORY SPECIALIST
209	GEN	92630	170	A	DIET THERAPY SPECIALIST
210	GEN	98130	1091	B	DENTAL ASSISTANT SPECIALIST
211	GEN	98230	202	D	DENTAL LABORATORY SPECIALIST

Note. The fourth digit in the AFS denotes skill level 3, 5, or 7.

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